

# FIELDIANA • ZOOLOGY

Published by  
CHICAGO NATURAL HISTORY MUSEUM

Volume 39

SEPTEMBER 17, 1956

No. 3

## A NEW PLETHODONTID SALAMANDER FROM NUEVO LEÓN, MEXICO

GEORGE B. RABB  
MUSEUM OF ZOOLOGY, UNIVERSITY OF MICHIGAN

In the collection of Mexican salamanders received by Chicago Natural History Museum from the first Hoogstraal Mexican Expedition there is a series of a hitherto undescribed species referred by Taylor (1944, p. 217) to the genus *Chiropterotriton*. I likewise regard this form as a *Chiropterotriton*, though in external appearance it somewhat resembles some small individuals of *Pseudoeurycea galeanae*, a member of the *P. cephalica* group occurring near-by in Nuevo León. In reference to its apparently primitive or generalized characteristics, it may henceforth be known as

***Chiropterotriton prisca***, new species. Figure 2.

*Type*.—Chicago Natural History Museum no. 95999, an adult female collected at an elevation of 8,000 feet on Cerro Potosí, near Ojo de Agua, about eleven miles west-northwest of Galeana, Nuevo León, Mexico, on August 16, 1938, by E. J. Koestner.

*Paratypes*.—CNHM 30625 (18) and UMMZ 112317-18, same data as the type; CNHM 30619, 30620 (5), 30621-22, and UMMZ 112316, from Ojo de Agua, Cerro Potosí, collected by Harry Hoogstraal on July 24, 1938; CNHM 30623-24, from the same place, collected by E. J. Koestner on August 16, 1938; and CNHM 30626 (10) and UMMZ 112319, from near the same place, at an altitude of 12,000 feet, collected by Harry Hoogstraal on July 21, 1938.

*Diagnosis*.—A species distinguishable from all other members of the genus by its combination of a robust body (adults 37-50 mm. snout-vent distance), relatively short legs (three to four costal spaces between adpressed limbs), and relatively slight dimorphism in maxillary-premaxillary tooth counts (33-42 in adult males, 42-53 in adult females). This combination will also separate it from all species presently considered as *Pseudoeurycea*.

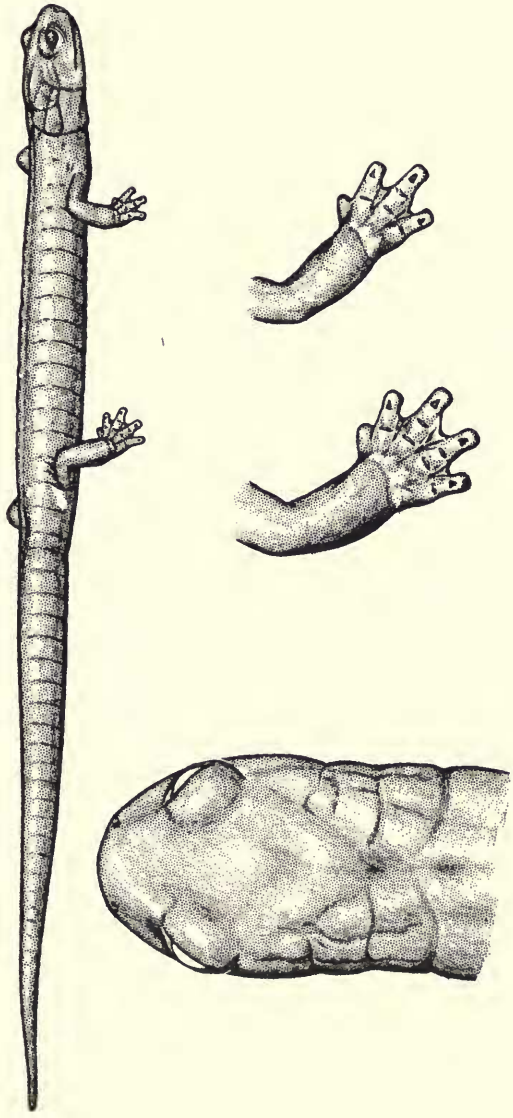
*Description of type.*—General aspect of body robust. Length of tail barely exceeds snout-vent length. Head length (snout to gular fold) contained in snout-vent distance about four and a half times; head width in the same about six and a half times. Width of head slightly less than the distance from snout to vertical groove at posterior angle of jaw, and about seven-tenths the distance from snout to gular fold. Distance from anterior angle of eye to tip of snout four-fifths of horizontal diameter of eye opening, giving a short-muzzled appearance to the head. Snout moderately truncate in dorsal view; internarial distance five-sevenths of anterior interorbital distance. Canthus rostralis rounded, the area below it sloping moderately to edge of jaw. Nostrils small, and nasolabial grooves and labial protuberances weakly developed. From the side the snout is seen to project slightly beyond the tip of the lower jaw. Head depth, measured from posterior angle of jaw to top of head, about two-fifths of head width. A faint horizontal postocular groove extends to the vertical portion of the fairly prominent gular fold. Lower jaw ovate.

Maxillary-premaxillary teeth (both sides) number 48, those on premaxilla slightly larger than those on maxilla. Fifty-three mandibular teeth. Prevomerine teeth 9 on right, 8 on left side, in single rows reaching in slight curves from just lateral to choanae to nearly meeting in midline of palate, where the distance between the rows is about the diameter of a choana. Parasphenoid teeth in two weakly separated obovate patches of approximately 60 teeth each. Fleshy sublingual fold well developed, laterally extending almost as far posteriorly as the mandibular teeth.

Legs separated by four costal spaces when pressed to sides of chunky trunk. Twelve costal spaces between axilla and groin, and eleven distinct costal grooves that extend on to, but not across, the belly. A twelfth faint groove in the axilla and a thirteenth short groove in the inguinal position. A weak mid-dorsal furrow. Post-iliac gland large and conspicuous. A moderately constricted ring immediately posterior to the vent at the base of the rounded tail, and thirty-two caudal grooves from this point to the blunt tip. Hind limb stouter than the forelimb and exceeding it slightly in length. Digits short, without marked tapering toward the tips. Terminal phalanges subtending small raised pads. Palms and soles with moderate pads. First fingers and toes almost completely enclosed by web. Webbing between other fingers and toes extending to distal edges of proximal phalanges, the terminal phalanx

590.5  
FI  
v. 39  
nr. 3  
col. 3

Nat. Hist. Surv.



H. J. WALTER

FIG. 2. *Chiropterorhynchon prisca*. Based chiefly on the type, CNHM 95999. Total length 98 mm.; head width 7.1 mm.

of the fifth toe thus being entirely free. Toes, in order of decreasing length, 3, 4, 5, 2, 1; fingers, 3, 2, 4, 1.

Color (in alcohol) brown suffused with lavender on dorsal surfaces of head, trunk, tail, and limbs. Sides progressively lighter than dorsum as the tan ventral surfaces are approached. Gular fold lacking pigmentation ventrally, as are the palms and soles. Guanine pigment apparent on dorsal surfaces in irregularly scattered white spots, chiefly posterior to the pelvic region. Under side of tail whitish, probably from a concentration of glands. Tip of tail unpigmented.

*Allotype*.—An adult male, UMMZ 112318, which is slightly smaller than the type, differs from the above description in several ways. It has a relatively wider and longer head (head width in snout-vent about six times; head length in same about four times). The snout is longer, though its relation to the diameter of the eye opening is about the same; it is also broader, as measured by the internarial distance. Nasolabial protuberances do not project downward so as to conceal the anterior part of the lower jaw from side view. The nearly circular mental gland is large (its diameter somewhat greater than that of the eye) and prominently raised.

The teeth are fewer in number and also larger than those of the type. There are 38 maxillary-premaxillary teeth (both sides), two of those on the premaxilla piercing the lip. Mandibular teeth 32, a rather low number, since in most males and females the mandibular count slightly exceeds the maxillary-premaxillary count. Vomerine teeth 7 on each side, and parasphenoid teeth in two patches of about 65 teeth each.

The adpressed limbs fail to meet by three costal spaces in this specimen. There is no apparent difference from the type in the webbing of the normal digits. On the right hand in this individual the third and fourth digits are fused, an anomaly of a sort appearing in several other specimens in the series.

*Sexual dimorphism*.—Males, the three largest all measuring 47 mm. in snout-vent length, do not appear to attain so large a size as females, of which the three largest measure 50 mm. in the same dimension. The average count of maxillary-premaxillary teeth in the ten clearly adult males is 37, that of 19 adult females is 48. There are ordinarily 7 or 8 vomerine teeth on a side in the adults; a *t* test of the means indicated no statistically significant difference between the sexes. Little dimorphism is evident in relative length of the legs as measured by costal spaces between the adpressed

limbs, though the males tend to be slightly longer-legged. The average, including both sexes, is about three and a half spaces. Rather small differences between the sexes can be seen in other proportions from the measurements of eight adults presented in Table 1.

*Ontogenetic and other variation.*—Many characters appear to change with the age of the animal, as judged by body size. The tail increases more rapidly in length than the body. In the two smallest specimens available with complete tails (snout-vent lengths 19 and 21 mm.) the tail is not quite 70 per cent of the snout-vent length, while in the mature group (snout-vent lengths 37–50 mm.) the tail, on the average, equals or barely exceeds the body length. The legs are relatively longer in younger specimens as determined by the costal spaces between the adpressed limbs. The nostril is large (about 0.5 mm.) in the younger specimens and becomes smaller with increasing body size.

In females there appears to be a general increase in number of maxillary-premaxillary teeth with increase in size. Of the thirteen males, only three are not unquestionably adult. Sizes of these three are 26, 32, and 35 mm., and tooth counts are 34, 41, and 49, in contrast to the average of 37 teeth (range 33–42) for the ten clearly adult males. The 35 mm. individual shows some development of vent papillae, but not very noticeable development of the mental gland, though the latter is difficult to judge because of the type of preservation. Apparently, these tooth counts indicate a reduction in replacements as the males mature, which is the ordinary process in several species of *Chiropterotriton*.

As in *Pseudoeurycea gadovi* and some species of *Chiropterotriton*, the young are considerably darker than the adults, particularly on the venter. Individual color variation is considerable in the various series but description of the total range would not be accurate because half of the specimens were badly preserved and are somewhat bleached and shrivelled. Fortunately, the largest series (CNHM 30625, UMMZ 112317–18) is well preserved. The most obvious differences between individuals are in the amounts of guanophore pigmentation. Some have none, others have small spots or streaks, particularly on the tail (as in the type), and a few have large whitish blotches (similar to those in *P. galeanae* and *scandens*) on the dorsal surfaces of head, trunk, or tail. There is also variation in the shades of the dorsal ground color, depending on the relative amounts of lavender and brown. The ventral colors in this series vary from

a dirty cream where the dark pigment cells are widely separated to a light tan where the dark cells are more or less reticulate.

*Skeleton*.—The following detailed description is primarily based on two cleared and stained adult specimens, a male 47 mm. and a female 50 mm. in snout-vent length. An X-ray photograph of another adult female was also used for describing some details. Two additional specimens were used for hyoid dissections.

The skull is broad, its maximum otic capsular width (5.0–5.25 mm.) greater than half its length from premaxillae to occipital condyles (8.75 mm.). The frontal processes of the fused premaxillae arise separately. They are thin and laterally compressed through most of their lengths, gradually flattening dorso-ventrally toward their posterior ends, which articulate with the grooved anterior projections of the frontal bones. The fontanelle enclosed by these moderately divergent processes is about 0.5 mm. at its greatest width. Posteriorly, the frontal bones form an irregular V-shaped margin for the fontanelle. The nasal elements, which angle slightly forward medially, are shaped like isosceles triangles, about 1.5 mm. on a side. The prefrontal is approximately rectangular, 0.4–0.5 mm. wide and 1.4–1.5 mm. long. It is slightly overlapped anteriorly by the nasal, laterally by the maxilla. The border of the circular nasolacrimal foramen is formed by the nasal, the prefrontal, and the facial lobe of the maxilla. With the nasal, the facial lobe of the maxilla forms a posterior margin to the nasal capsule. On the lower portion of the capsule there is a conspicuous, slightly curved septomaxilla, smaller in the male than in the female (in which it is about 0.25 mm. long). There are no ridges or lateral projections on the otic-occipital region. The stylar process, which arises from the antero-dorsal border of the columella, makes contact with the squamosal. The prevomerine elements almost touch in ventral midline posteriorly but are separated by a fontanelle approximately 0.25 mm. wide anteriorly. The dentary ridges of the prevomers bear an average of ten teeth in the two cleared specimens. Dagger-like posterior processes arise medially from the dorsal surfaces of the dental ridges. These processes appear to be continuous with the bony plates bearing the so-called parasphenoid teeth. The mandibular teeth number 23–26 in the male, and 30–30 in the female. The male has 19–16 maxillary teeth and 5 teeth on the premaxilla. In the female the corresponding figures are 23–25 and 6.

The length of an epibranchial cartilage is almost twice that of the median copula. The anterior end of the first ceratobranchial

TABLE 1.—MEASUREMENTS (in mm.) OF EIGHT ADULTS OF *C. prisca*

	CNHM 30625.20	CNHM 30625.01	UMMZ 112318	CNHM 30625.11	CNHM 30625.04	UMMZ 112317	CNHM 95999 (Type)	CNHM 30625.05
	♂	♂	♂	♂	♀	♀	♀	♀
Sex.....								
Snout-vent length*.....	42	44	46	47	42	46	48	50
Tail length.....	42	45	47	45	41	46	50	50
Snout-eye.....	2.0	1.9	2.3	2.3	1.8	1.9	2.1	2.3
Snout-angle of lower jaw.....	6.4	7.3	7.8	7.8	6.4	7.3	7.4	7.6
Snout-center of gular fold.....	10.0	10.1	10.9	11.0	9.5	10.3	10.4	11.2
Internarial width.....	2.5	2.6	2.9	2.9	2.5	2.5	2.5	2.6
Interorbital width.....	3.4	3.4	3.8	3.9	3.2	3.5	3.5	3.8
Maximum head width.....	6.9	7.1	7.8	7.5	6.5	7.2	7.1	7.6
Horizontal eye width.....	2.4	2.5	2.6	2.6	2.3	2.5	2.5	2.5
Arm length.....	9.1	9.0	9.9	9.8	7.8	9.3	9.4	9.6
Leg length.....	10.0	10.1	10.4	10.9	8.9	10.1	10.4	10.3

\* Measured to posterior end of vent.

may have a flattened medial flange or terminate as a simple knob. A lingual cartilage was present in one of three specimens examined. The *M. hyoglossus* may be said to be intermediate in attachment, not in the complete ventral position described by Tanner (1952) for other species of *Chiropterotriton* and not completely anterior as in *Pseudoeurycea*.

The broad atlas is incompletely ossified mid-dorsally. The dorsal crests or neural ridges of the remaining body vertebrae are weakly developed, gradually disappearing posteriorly. There are paired dorsal projections on the posterior margins of these vertebrae. From the atlas to the sacral vertebra there are 14 body vertebrae, most of them about twice as long as broad; all but the one immediately preceding the sacral vertebra bear ribs that are deeply forked proximally. The two postsacral vertebrae are followed by 26 caudal vertebrae in one specimen and 34 in another. The forward-angling transverse processes of the caudal vertebrae are rather short and broad. The transverse processes of the first caudal vertebra angle forward to a point very slightly anterior to its prezygapophyses.

The girdles and limbs are normal for the genus, the pectoral girdle exhibiting an anterior process from the procoracoid ossification. The metacarpals and metatarsals are moderate-sized. The mid-sections of the phalanges are little constricted. The terminal phalanges are about twice as long as broad and are wider proximally than distally, the T-shaped expansion at the tip being very slight.

*Reproductive organs.*—Adult males have heavily black-pigmented testes and associated ducts, and in larger males the testes are bilobate. The female sex organs are mostly free of dark pigment, though the peritoneal mesenteries in both sexes are pigmented. Eggs in the two adult females examined ranged from 7 to 10 on a side. The eggs were large, measuring about 1.2 mm. in diameter.

*Habitat.*—The field data accompanying the specimens are meager, but altitudes of 8,000 to 12,000 feet are listed. Some specimens were taken beneath pine logs, others under bark of logs and fallen trees. The descriptions by Muller (1939) of the vegetational associations of Cerro Potosí indicate that pine and pine-fir forests occur from 8,000 to 12,000 feet on several slopes.

*Relationships.*—Anatomically, *prisca* seems somewhat intermediate between other species of *Chiropterotriton* and the *Pseudoeurycea cephalica* group. It differs from the *cephalica* group in having a relatively unpigmented venter, shorter legs, septomaxilla, low tooth counts, apparent reduction in tooth replacement in maturing



males, and more substantial palmar pads. It differs from other species of *Chiropterotriton* by the nature of its guanophore pigmentation; it also differs slightly in the shape of the fronto-premaxillary fontanelle and in the thickness of the transverse processes of the first caudal vertebra. The lack of decided sexual dimorphism in relative leg lengths and in number of vomerine teeth contrasts with the condition in most species of *Chiropterotriton* and the *cephalica* group. Because of their variability, characters in the throat anatomy of *prisca* (the lingual cartilage, the anterior end of the first ceratobranchial, and the attachment of the *M. hyoglossus*) may be considered intermediate between the two groups. As a member of the *cephalica* group its characters in general appear to be specialized, with several incongruous ones. The chief characters better support an interpretation of it as a primitive and generalized species of *Chiropterotriton*, and the variability in other traits is more to be expected in a generalized than in a specialized form. This is convenient taxonomically, since it provides a rigid character, the presence of the septomaxilla, for separating the two groups. A discussion of this and other anatomical features of *Chiropterotriton* and *Pseudoeurycea* is in preparation.

Geographically, the nearest neighbor is *Pseudoeurycea galeanae*, which, except for four specimens from Hidalgo (see Walker, 1955), is known only from the area about Pablillo, Nuevo León. This locality is about 30 miles east-southeast of Cerro Potosí. The elevation given by Taylor (1941) for the type locality is 7,000 feet, and that reported by Dunn (1936) for two specimens (ANSP 20024,20030) which I determined as *galeanae* is 8,000 feet. From Muller's (1939) maps of the region these two places probably support at least pine-oak stands and perhaps "subalpine humid" forests of *Pinus montezumae*, in contrast to the desert or chaparral formation at 5,200 feet in which most of the known specimens of *galeanae* were taken. Thus it is likely that *prisca* and *galeanae* may be found to occur together at high altitudes in Nuevo León, and perhaps in Tamaulipas on Peña Nevada. *P. galeanae* should be distinguishable in the field from *prisca* by the much larger size of the adults, the coloration (especially the more darkly pigmented venter), the more complete inclusion of the outer toe in foot-webbing, and the short, round, blunt-tipped tail that appears to be correlated with a caudivagant type of progression.

*Acknowledgments.*—I wish to thank Dr. R. F. Inger, of Chicago Natural History Museum, for making available the specimens

described above, and Dr. E. H. Taylor, of the University of Kansas, for informing me of their whereabouts. Specimens of *P. galeanae* were borrowed from the collections at Philadelphia through the courtesy of the late E. R. Dunn. I am indebted to Dr. C. F. Walker, of the University of Michigan Museum of Zoology, for critical reading of the typescript, and particularly to Mr. Harold J. Walter, whose drawings grace this paper. The abbreviations CNHM, UMMZ, and ANSP respectively designate Chicago Natural History Museum, the University of Michigan Museum of Zoology, and the Academy of Natural Sciences of Philadelphia.

## REFERENCES

- DUNN, E. R.  
1936. The amphibians and reptiles of the Mexican expedition of 1934. Proc. Acad. Nat. Sci. Philadelphia, 88: 471-477.
- MULLER, C. H.  
1939. Relations of the vegetation and climatic types in Nuevo Leon, Mexico. Amer. Midl. Nat., 21, no. 3, pp. 687-729.
- TANNER, W. W.  
1952. A comparative study of the throat musculature of the Plethodontidae of Mexico and Central America. Univ. Kansas Sci. Bull., 34, pt. II, no. 10, pp. 583-677.
- TAYLOR, E. H.  
1941. Two new species of Mexican plethodontid salamanders. Proc. Biol. Soc. Washington, 54: 81-86.  
1944. The genera of plethodont salamanders in Mexico, Pt. I. Univ. Kansas Sci. Bull., 30, pt. I, no. 12, pp. 189-232.
- WALKER, C. F.  
1955. A new salamander of the genus *Pseudoeurycea* from Tamaulipas. Occ. Papers Mus. Zool. Univ. Michigan, no. 567.